

## REMARKS

Applicant respectfully requests reconsideration of the present application in view of the foregoing amendments and in view of the reasons that follow.

Claims 1-7 and 9-12 are currently being amended.

Claim 16 is being added.

This amendment adds, changes and/or deletes claims in this application. A detailed listing of all claims that are, or were, in the application, irrespective of whether the claim(s) remain under examination in the application, is presented, with an appropriate defined status identifier.

After amending the claims as set forth above, claims 1-7, 9-12 and 16 are now pending in this application.

Applicants wish to thank the Examiner and his supervisor for granting an after-final interview. Agreement was reached regarding the reissuing of the preceding action with additional explanation of the Patent Office's positions.

However, the current Office Action has not remedied the deficiencies of the prior Office Actions. Applicants made clear their request for the Examiner to support his assertions with valid citations to the prior art and that he provide a prima facie case regarding the rejections by applying the art to the claims. However, the Office Action continues to merely provide a listing of portions of a very lengthy prior art reference that contain certain terms found in the claims, regardless of their context or meaning in the cited portions of the reference. In many instances, the Examiner's apparent interpretation is contrary to the plain meaning of the terms as used in the cited prior art and no further explanation is given. In addition, despite Applicants request for support for the Examiner's assertions, the current Office Action attempts to merely take Official Notice of facts that the Examiner has already asserted and that Applicants have previously requested, in accordance with PTO protocol, prior art be cited in support of. Applicants have

previously, and again now, request that the Examiner provide an application and explanation of the cited prior art to the claims, including prior art which supports the asserted facts that have been Officially Noticed.

## **Background**

In a First Office Action issued April 18, 2007, the Examiner rejected claims 1-15 under 35 U.S.C. §101 as being directed to non-statutory subject matter. The Examiner also rejected claims 1-15 under 35 U.S.C. §102(b), asserting that the claims are anticipated by TOPCCIP's *Preliminary Research and Development Roadmap for Protecting and Assuring the Energy Infrastructure*. ("Preliminary Roadmap Reference" or "Reference"). Applicants amended the claims to overcome the rejection.

The Examiner continued the rejection in the Second Office Action (made final) issued September 17, 2007 continuing the same rejections as the First Office Action. After an interview, as discussed above, the current Third Office Action (non final) was issued.

## **Rejections**

### **§101**

The Third Office Action rejects claims 1-15 under §101 as being directed to non-statutory material and also separately rejects claims 1-12 for the same reason under §101. Applicants understand the rejection to be directed to all of the pending claims 1-12. Applicants have amended claims 8-12 which positively claim a computer implemented system for simulating interdependent infrastructures, comprising a central processing unit (CPU) and a storage device coupled to the CPU and having information stored therein for performing the limitations previously described by the apparatus in claims 8-12 respectively.

Regarding claims 1-7, Applicants have amended the claims to be directed to methods as recited in the originally filed claims. Applicants respectfully submit that the claims are not directed to software per se. Rather the claims are directed to the statutory category of a

“process”. The claims do not limit the methods to being performed only as part of a software program. The claims are clearly directed to a method of achieving a useful, tangible, and concrete final result, i.e. the presentation of the results of the simulation. The fact that such methods can be performed by a computer as software does not itself render the claims software per se, where the methods are otherwise directed to statutory subject matter (here, a process). The method produces a simulation, which is a useful, tangible and concrete result.

Applicants respectfully submit that the rejection under §101 has been overcome.

### **§112**

The Examiner has rejected claims 1-12 under 35 U.S.C. §112, first paragraph for lack of enablement. Specifically, the Examiner states that the limitations of equivalencing a subset and re-equivalencing the subset are not described in such a way as to enable one skilled in the art to make or use the invention. Applicants note that the concept of “equivalencing” two items, in the general sense, is well known for comparative applications. Applicants further note that equivalencing is described by the application at FIG. 9 (showing an overview flow chart of an equivalencer) and paragraph [0050], and is further described by Claim 5. Paragraph [0050] clearly discloses how to perform equivalencing by “identifying connections extending outside of the subset” and then “calculating flow limit for each connection extending outside the subset.” These steps are clear to someone with ordinary skills in the art.

In addition, the Examiner has rejected claims 5 and 10 under §112 for lack of enablement of the limitation “flow limit”. As regards the term “flow limit”, this term has its ordinary meaning in the art. “Flow” is generally understood to mean “The movement of energy, material, or information from one place to another.” That is, “flow” in an infrastructure (e.g., electric power, gas line, phone line) is understood to be transmission of the relevant medium (e.g., electric, current gas) over the infrastructure (wires, pipeline) relative to time. “A “limit” to a flow or “flow limit” is, as its plain meaning indicates, a restriction on the amount of flow possible. “Limit” is generally understood to mean “the greatest amount of something that is possible or allowed.” It

is generally well known and understood that the maximum transmission capacity at a given point in the infrastructure (e.g., the maximum current a wire can handle without failing). One of ordinary skill would appreciate the inherent physical limitations presented by an infrastructure on flow, i.e. a pipeline or wire will only be able to transport a certain amount of medium in a given time.

Applicants respectfully submit that the §112 rejections have been overcome.

### §102

Turning to the prior art rejections, The Examiner also rejected claims 1-15 under 35 U.S.C. §102(b), asserting that the claims are anticipated by the Preliminary Roadmap Reference. Applicants understand this rejection to be directed to all of the pending claims 1-12. Applicants respectfully request clarification of the §102 rejection and suggest a telephonic interview may be helpful in clarifying this matter.

Applicants have previously noted that the Preliminary Roadmap Reference fails to teach the claimed limitation of “equivalencing the subset.” The Examiner states at 16.2 “Applicants arguments in subsection 2 supra have been fully considered and are found persuasive. See new grounds for rejection presented below.” Applicants submit that the §102 rejection should be withdrawn, as the Examiner appears to agree that the Preliminary Roadmap Reference does not teach, at the least, the claimed limitation of “equivalencing the subset.” As Applicants are unsure as to the status of the §102 rejection based on the Examiners comments, Applicants reiterate and incorporate by reference their arguments of the June 19, 2007 Amendment and Reply. In particular, Applicants note that the Preliminary Roadmap Reference specifically indicates that “[r]esearch on network equivalencing is also needed.”

Applicants have also previously noted that the Preliminary Roadmap Reference fails to teach the claimed limitation of “creating a plurality of agents to interact with the subset.” The Examiner’s response to Applicant’s arguments is, as set forth in the Third Office Action, “This issue has been addressed in the new grounds of rejection and explanation provided above.”

Applicants respectfully request clarification. As best understood and interpreted, Applicants understand the Examiner to be referring to the §103 argument regarding this claim limitation and the Official Notice taken regarding what the Examiner refers to as “subset theory”. Applicants refer to their comments infra regarding this limitation and the Examiner’s Official Notice.

Applicants respectfully submit that the §102 rejection is improper and, regardless, has been overcome.

### **§103**

Turning now to new grounds of rejection based upon the prior art, claims 1-12 have been rejected under 35 U.S.C. §103(a) as being unpatentable over the Preliminary Roadmap Reference in combination Office Notice taken by the Examiner. The Examiner acknowledges that the References fails to teach every element of the claims. Applicants reiterate their previous arguments of the prior Amendment and Reply of June 29, 2007, and incorporate such by reference herein. Applicants submit that no combination of prior art has been asserted that teaches each limitation of the claims. Thus, Applicants respectfully request withdrawal of the rejection of the claims and allowance thereof.

#### ***Improper Official Notice***

The Examiner has taken the position that the Preliminary Roadmap Reference discloses all of the claimed features except “selecting from a set of infrastructure systems a subset comprising a plurality of interdependent infrastructure systems, and equivalencing the subset.” The Examiner states that “Official Notice” is taken with respect to this limitation. The Examiner has now merely formally stated that Official Notice is being taken regarding facts that he has previously asserted. Applicants have already made clear that they traverse such assertions and request a citation to prior art teaching such facts. Applicants again reiterate such request.

In addition, Applicants note that the limitations being Officially Noticed by the Examiner are of the type that have traditionally not been within the scope of “official notice.” See, e.g., *In re Ahlert*, 424 F.2d 1088 (CCPA 1970); see, also, *In re Zurko*, 258 F.3d 1379 (Fed. Cir. 2001).

Any facts noticed should serve only to "fill in the gaps" in an insubstantial manner which might exist in the evidentiary showing made by the examiner to support a particular ground for rejection. However, the Examiner is relying on Office Notice to fill substantive limitations that go to the heart of patentability of the Applicants invention.

Applicants note specifically that the Examiner's assertion of "subset theory" is contrary to the courts view of the scope of Official Notice. It has been previously held that the Patent Office must provide evidentiary support for the existence and meaning of a theory, rather than merely relying on Official Notice. See, *In re Grose*, 592 F.2d 1161 (CCPA 1979). The Examiner has merely asserted a theory, with no proof that such was known in the art. Furthermore, Applicants have previously requested an explanation of the Examiner's previous statements regarding so-called "subset theory."

In addition, the Examiner has taken Official Notice regarding equivalencing yet continues to rely on the language of the reference that states "research on network equivalencing is also needed." Applicants again reiterate their prior statements regarding this argument. The cited language, rather than anticipating or rendering the limitation obvious or even supporting an Office Notice, provides a strong indication of the unfilled need and no recognition of the solution to the problem in the art. The Examiner has not cited a prior art reference that actually teaches the claimed limitation or solves the problem. The Examiner's taking of Official Notice that equivalencing is known when the references in the record clearly establish that such equivalencing was not known is improper.

### ***Inadequacies of the Office Notice***

Regardless of the deficiencies of the Office Notices, the inadequacies in the Office Notice and the Office Action are clear upon closer evaluation.

The Examiner has cited Tab B, B-82 Top of the Preliminary Roadmap Reference, which states:

Interdependency tools need to address large-scale interdependency issues that affect more than one infrastructure from a technical, economic, and national security perspective. Traditional modeling and simulation tools, while capable of addressing a subset of these issues for a portion of a single infrastructure, are not computationally capable of addressing the complexities and uncertainties associated with these issues on a national level. In particular, the number of infrastructure dependencies and dynamic feedback loops that need to be considered is prohibitively large (i.e., computationally intractable). New computational algorithms and supercomputing capabilities have the potential for efficiently and effectively addressing these modeling and simulation shortfalls. With enhanced computational capabilities, it would be possible to comprehensively address, for the first time, infrastructure dependencies and real-time interactions within a technical, economic, and security framework.

As is clear from this section, selecting from a set of infrastructure systems a subset comprising a plurality of interdependent infrastructures is not taught. While the cited paragraph does include the term “subset” and “infrastructure”, an actual reading of the paragraph makes clear that the subset being referred to is a subset of “large-scale interdependency issues” not of infrastructure systems.

While the Examiner appears to be relying on some “motivation” provided by the Reference, this portion of the Preliminary Roadmap Reference, as well as the reference as a whole, does not provide any motivation to select from a set of infrastructure systems a subset comprising a plurality of interdependent infrastructures. Rather, the Reference states that current computer systems are only able to handle a portion of the issues associated with infrastructures due to their complexity. This provides motivation for, perhaps, an improved computer system that can address all of the issues. Applicants fail to see any suggestion from the teaching that there are issues associated with interdependent infrastructures to motivate someone to select a subset of interdependent infrastructures. The Reference is simply referring to an entirely different concept.

In addition, Applicants note that the Examiners arguments focus on “infrastructure dependencies”, while the claimed limitation relates to interdependent infrastructures.

***“Subset theory”***

Turning to the Examiner’s assertion that the claimed limitation of selecting a subset is rendered obvious in light of “subset theory”, Applicants highlight that the Examiner has completely read limitations out of the claims. That claim language requires “selecting from a set of infrastructure systems a subset comprising a plurality of interdependent infrastructure systems.” The Examiner’s unsupported theory is that selecting a whole set is equivalent to selecting a subset containing all of the elements of the set. The Examiner’s interpretation of the claims is contra to several tenets of claim interpretation.

First, the Examiner has ignored the limitations that the set must be infrastructure systems and that the subset must be a plurality of interdependent infrastructure systems. Even assuming the Examiner’s position regarding subset theory is correct and supported in the prior art, the Reference does not, and has not been asserted, to teach selecting of a plurality of interdependent infrastructures, which would still be required even under the Examiner’s interpretation.

Second, the Examiner has interpreted the meaning of “subset” in such a way as eviscerate the meaning of the claim language and to render the limitation superfluous. Applicants submit that one of ordinary skill would appreciate that selecting a subset of a set involves selecting a species from the genus that represents a smaller population than the overall genus.

For at least the above reasons, the rejection of the claims should be withdrawn and Applicants request allowance of the claims.

***Dependent claims***

In light of the above, Applicant submits that the prior art fails to teach any of the claimed limitations. Regarding the dependent claims, the TOPCCIP reference likewise fails to provide any of the limitations as it does not teach interdependency. As with the independent claims the



Examiner has merely cited to various portions of the Reference without applying such to the claims. Applicants have previously requested explanation of such rejections. Applicants again repeat their request. The rejections appear to be based merely on a key-word search of the Reference for certain words found in the respective claims, with no analysis to the actual usage of the words or their context.

Applicants submit that the Reference fails to teach the limitations of the dependent claims. For example, the geographic references in the TOPCCIP reference cited by the Examiner are within a single infrastructure (claim 2), related to selecting a subset of infrastructures based on their geographic region. Applicants again stress that an actual reading of the passages cited by the prior art makes clear that the References does not provide a teaching of the claim limitation. For example, B19 Middle states “The objective of this research would be to design hardware and software systems that can accurately collect and manage large data streams that emanate from geographic locations throughout the grid.” Applicants fail to see how such a statement that research is intended to design a system (not that the system has been designed or works) to collect data from various locations in the electric power grid teaches the claimed limitation.

Regarding claim 3, the Examiner again appears to be relying on portions of the Reference merely based on their usage of a single term from the claim limitation. For example, Table B.4 Item 6.2 teaches “Improve operation and information; provide more options at crisis times; improve system reliability. Hardware and software: improved two-way communications for load”. Applicants fail to see, aside from the use of the term “two-way”, which is in regard to the type of communication, how the References discloses the selection of components for a two-way analysis wherein the simulation occurs across concurrent time, as is claimed.

The reference cited by the Examiner as precluding claim 4 “selecting a plurality of infrastructures to simulate; and connecting the infrastructures, including the steps of screening candidate interconnections” merely mentions that “fault scenario screening tools... are candidates for research initiatives” (B-49), and, if the connection is not tenuous enough, the latter is suggested for a single infrastructure. The second part of claim 4, “assigning candidates a

likelihood of connection,” is not even suggested in the TOPCCIP report. The Examiner cites the section describing the threats facing energy systems, “energy companies can minimize the impacts of highly unlikely events, such as multiple simultaneous equipment failures at a single site” (B-11 top). This refers only to connections within a single infrastructure, here the energy system, not to connections between infrastructures.

The TOPCCIP reference refers to identifying connections outside of the subset only in terms of identifying connections within one infrastructure, and only that cryptically, discussing the need to create a national energy infrastructure (B-3 middle) and the need to develop a comprehensive picture of the gas pipeline transmission network (B-54) (claim 5). The TOPCCIP reference refers to creation of agents as a modeling tool, but only by the following: “It may be advisable to investigate... agent-based computational methods” (B-50 top), and table B.6 sets a goal of the year 2010 for the development of autonomous agents. Again, these vague objectives are mentioned in reference merely to gaining a better understanding of a single infrastructure.

The references that the Examiner asserts disclose claim 7 refer to the existing control centers of the electric power grid (B-5), of one infrastructure only, not to a model of multiple infrastructures. The TOPCCIP report also refers to a goal of developing faster control so that a given infrastructure system can react “rapidly enough to maintain stability under contingencies conditions” (B-47), not to an existing product that will model whole subsets of infrastructure systems “until a steady state is achieved” (claim 7).

#### ***Newly added Claim 16***

Applicants have added claim 16, and amended claims 9-12 to depend therefrom. As previously stated, claim 16 is directed to a system having a CPU and memory, with the memory containing instructions for carrying out the method steps of claim 1. Further support is found in Figure 1 and in paragraphs [0043] – [0046]. As the Examiner has indicated, the prior claimed limitations clearly would be interpreted by one of ordinary skill in the art, in light of the Applicants disclosure, as being performable as part of a software program. It is well known in

the art that such a program can be resident on a storage medium and accessed by a CPU. For at least the previously enumerated reasons, Applicants submit that the claims are allowable.

***Amended Claim 1***

In addition to amending claim 1, as previously discussed, to be directed to method claims as originally filed, Applicants have added the limitation “presenting results of the simulating”, which finds support through the application, but particularly at Figure 1, reference number 112.

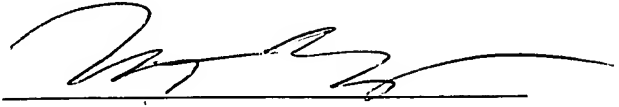
As such, Applicant submits that all of the claims rejected based the aforementioned reports are patentable over these references.

Applicant believes that the present application is now in condition for allowance. Favorable reconsideration of the application as amended is respectfully requested.

The Examiner and his Primary or Supervisory Patent Examiner are invited to contact the undersigned by telephone if it is felt that a telephone interview would advance the prosecution of the present application.

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 19-0741. Should no proper payment be enclosed herewith, as by a check or credit card payment form being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 19-0741. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extension under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 19-0741.

Respectfully submitted,

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